American Cities
Climate Challenge

CITY OF SAN ANTONIO
OFFICE OF SUSTAINABILITY

# BENCHMARKING ADVISORY COMMITTEE
# Meeting-3

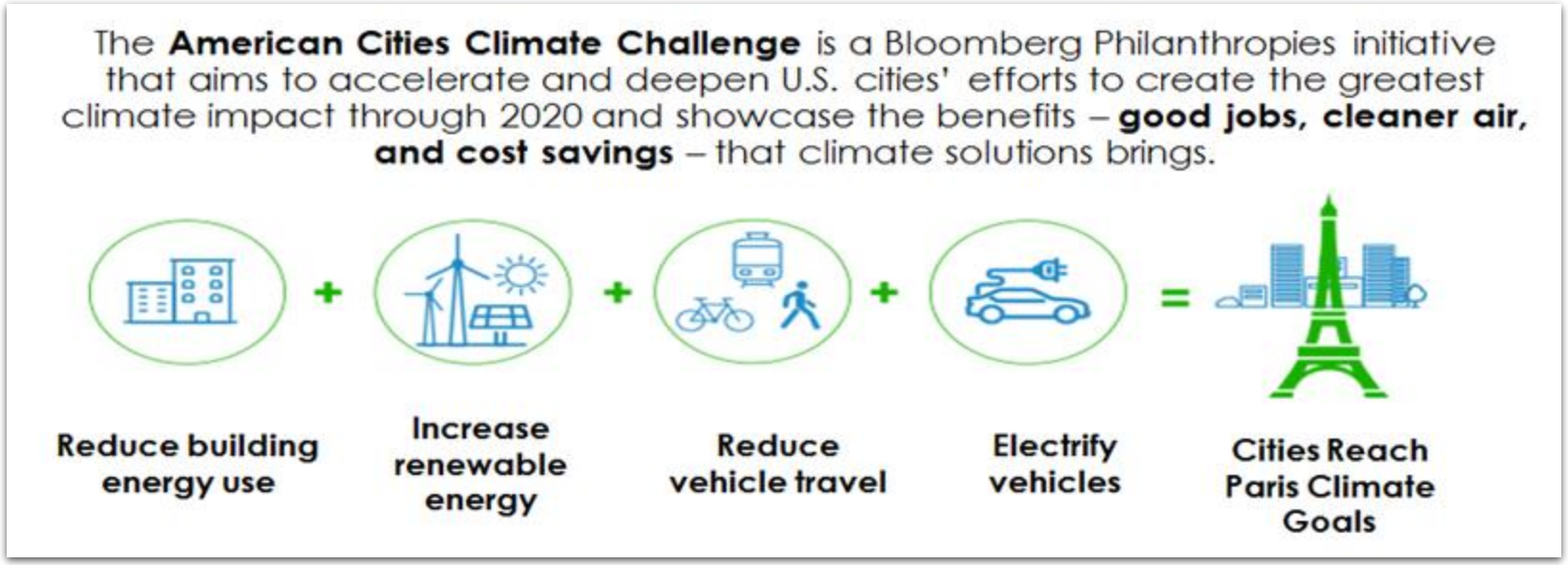
January 21, 2020

# OUR GOALS FOR TODAY

- Review Meeting-2 highlights; brief overview of benchmarking
- How to make ENERGY STAR Portfolio Manager work for you
- Assess capacity development needs for building owners and property managers

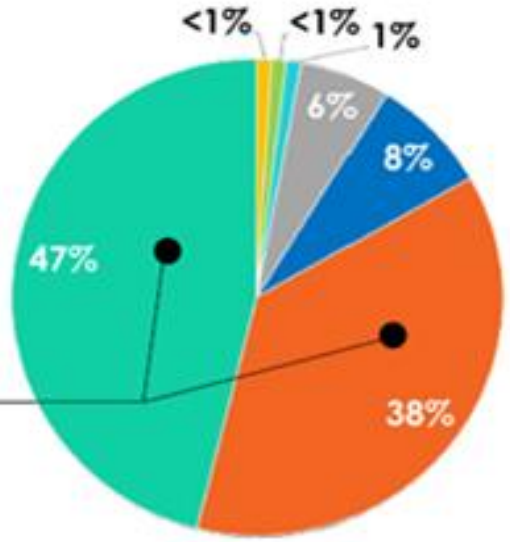
# Background

- SA Tomorrow Sustainability Plan adopted August 11, 2016
  - Vision: *"San Antonio is a leader in high performance and resilient buildings and infrastructure."*
- On September 24, 2018, the EPA announced that Bexar County was in marginal nonattainment of federal ozone standards.
- On June 22, 2017, City Council passes Resolution # 17-3844 in support of the Paris Climate Agreement.
- San Antonio's population projected to increase by one million people by 2040.
- San Antonio's Climate Action and Adaptation Plan, adopted on October 17, 2019, identifies benchmarking of large buildings as a strategy to reduce energy consumption



# San Antonio's 2016 Greenhouse Gas Emissions

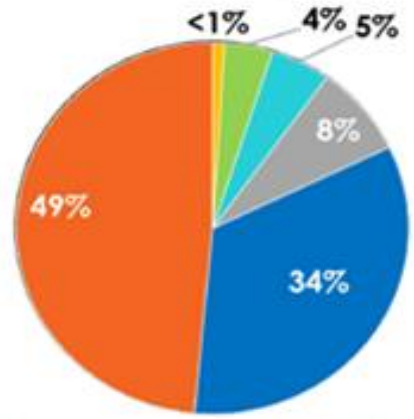
**85%**
of the opportunity to reduce GHG emissions lies within Transportation & Buildings




## San Antonio's Total Emissions by Sector

- <1% Water/Wastewater Operations
- <1% CPS Energy Natural Gas System Fugitives
- 1% Energy Industry
- 6% Solid Waste
- 8% Industrial Process
- 38% Transportation
- 47% Building Energy

**Building Sector Energy Use**




**FUEL**

- <1% Residential Fuel
- 5% Industrial Fuel
- 8% Commercial Fuel

**ELECTRICITY**

- 4% Industrial Electricity
- 34% Residential Electricity
- 49% Commercial Electricity

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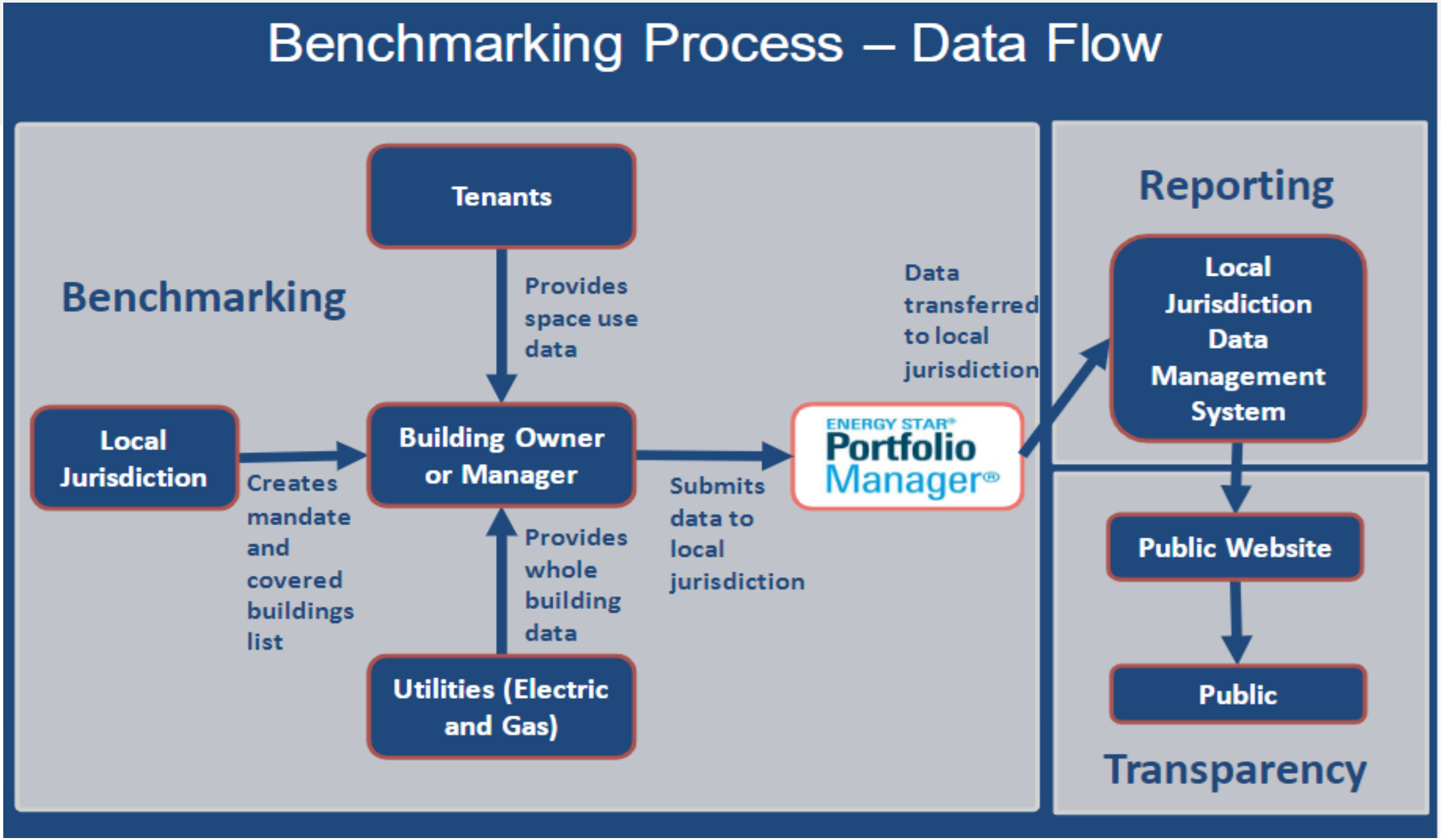
# Meeting 2 Recap

# Meeting 2 - Recap

- Energy Data Management in ESPM by Anna Morton
- Data flow process (stakeholders – City)
- Energy data privacy and use
  - Benchmarking program will begin City wide energy data tracking and management for large buildings
  - BAC Members interested in how ENERGY STAR Scores are affected for unique buildings


Benchmarking Process – Data Flow
Benchmarking
Tenants
Provides space use data
Local Jurisdiction
Creates mandate and covered buildings list
Building Owner or Manager
Provides whole building data
Utilities (Electric and Gas)
Submits data to local jurisdiction
ENERGY STAR® Portfolio Manager®
Data transferred to local jurisdiction
Reporting
Local Jurisdiction Data Management System
Public Website
Public
Transparency

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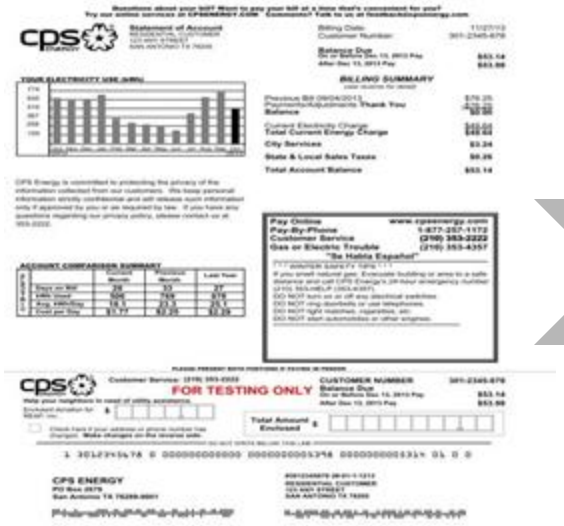
# Introduction to Benchmarking

# How is Portfolio Manager used in the Benchmarking Process?

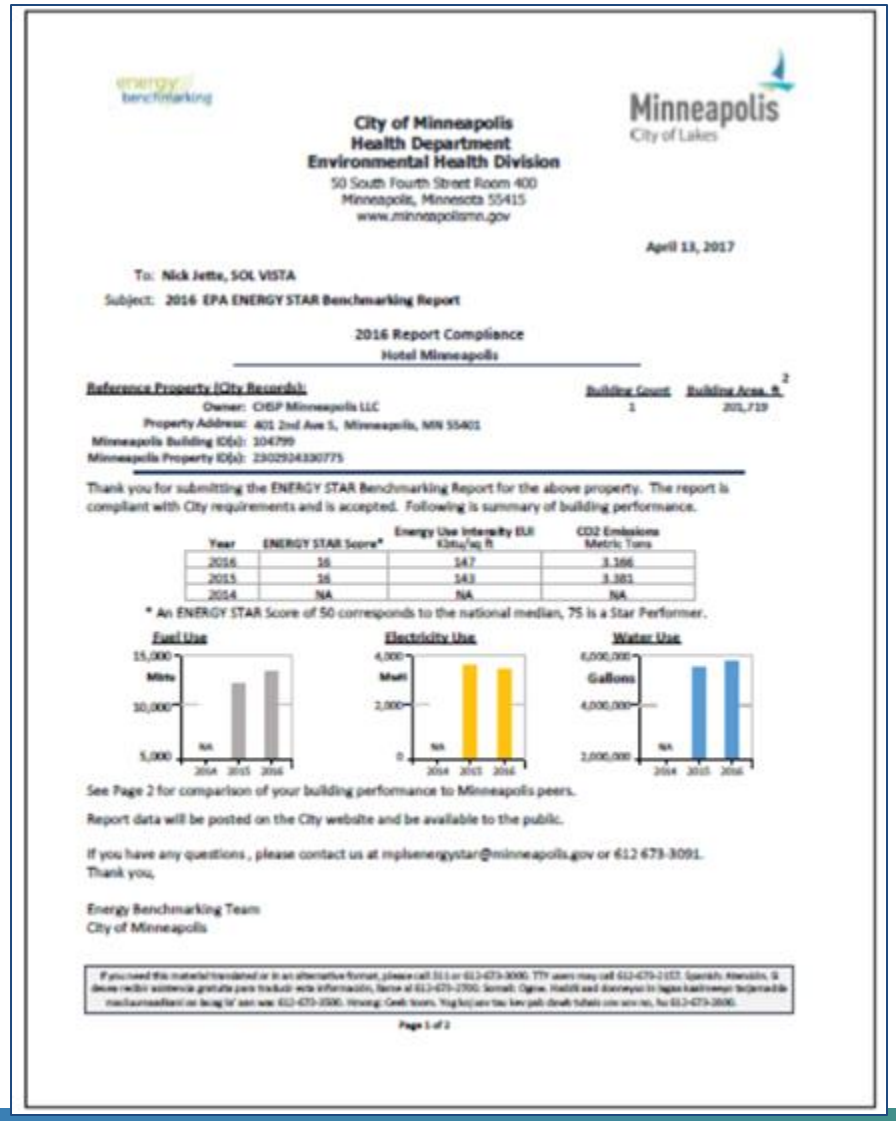


upload utility data to property

share property with the city

CITY OF SAN ANTONIO TEXAS

# Building Energy Scorecards
## City of Minneapolis



City of Minneapolis
Health Department
Environmental Health Division
50 South Fourth Street Room 400
Minneapolis, Minnesota 55415
www.minneapolismn.gov

April 13, 2017

To: Nick Jette, SOL VISTA

Subject: 2016 EPA ENERGY STAR Benchmarking Report

2016 Report Compliance
Hotel Minneapolis

Reference Property (City Records):
Owner: CHSP Minneapolis LLC
Property Address: 401 2nd Ave S, Minneapolis, MN 55401
Minneapolis Building ID(s): 104799
Minneapolis Property ID(s): 2302924330775

Building Count: 1
Building Area, ft²: 201,719

Thank you for submitting the ENERGY STAR Benchmarking Report for the above property. The report is compliant with City requirements and is accepted. Following is summary of building performance.

| Year | ENERGY STAR Score* | Energy Use Intensity EUI Kbtu/sq ft | CO2 Emissions Metric Tons |
|---|---|---|---|
| 2016 | 16 | 147 | 3,166 |
| 2015 | 16 | 143 | 3,381 |
| 2014 | NA | NA | NA |

* An ENERGY STAR Score of 50 corresponds to the national median, 75 is a Star Performer.

Fuel Use


Electricity Use


Water Use

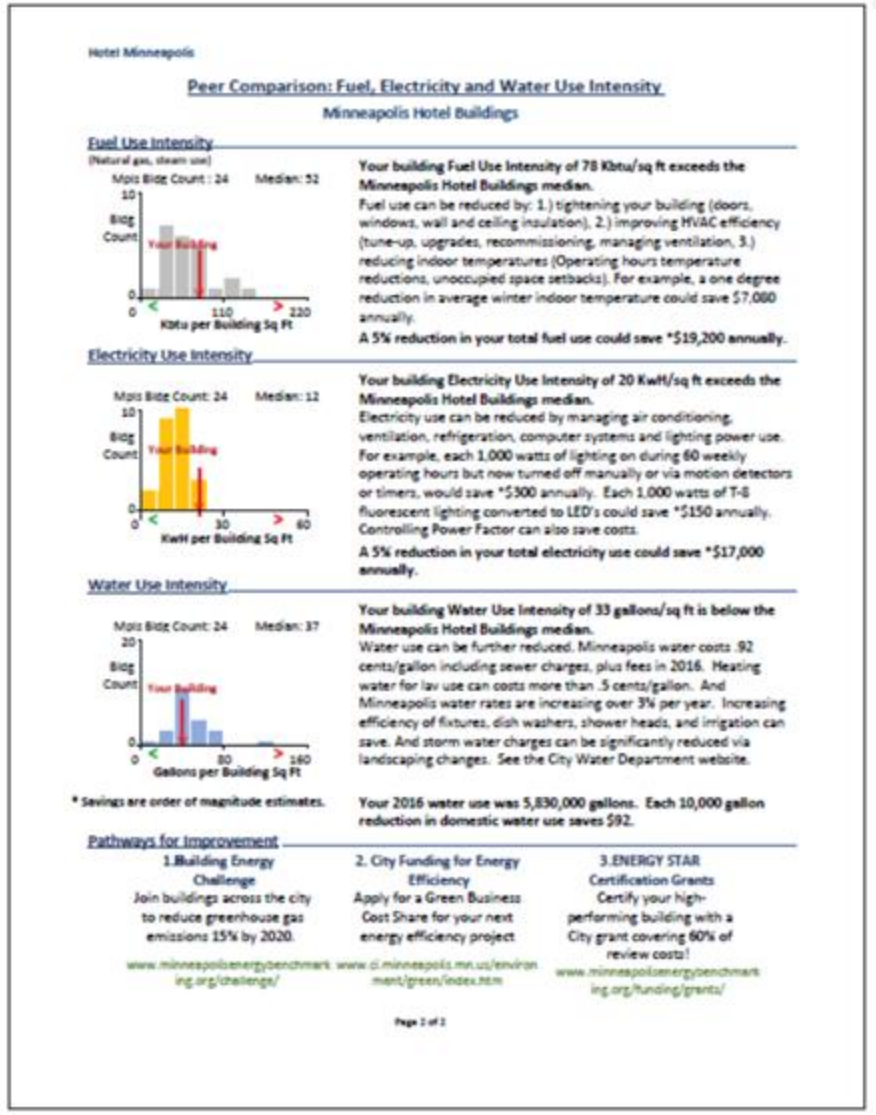

See Page 2 for comparison of your building performance to Minneapolis peers.

Report data will be posted on the City website and be available to the public.

If you have any questions, please contact us at mplsenergystar@minneapolis.gov or 612 673-3091.
Thank you,

Energy Benchmarking Team
City of Minneapolis

Page 1 of 2



Hotel Minneapolis

Peer Comparison: Fuel, Electricity and Water Use Intensity
Minneapolis Hotel Buildings

Fuel Use Intensity
(Natural gas, steam use)




**Your building Fuel Use Intensity of 78 Kbtu/sq ft exceeds the Minneapolis Hotel Buildings median.**
Fuel use can be reduced by: 1.) tightening your building (doors, windows, wall and ceiling insulation), 2.) improving HVAC efficiency (tune-up, upgrades, recommissioning, managing ventilation, 3.) reducing indoor temperatures (Operating hours temperature reductions, unoccupied space setbacks). For example, a one degree reduction in average winter indoor temperature could save $7,080 annually.
**A 5% reduction in your total fuel use could save *$19,200 annually.**

Electricity Use Intensity




**Your building Electricity Use Intensity of 20 KwH/sq ft exceeds the Minneapolis Hotel Buildings median.**
Electricity use can be reduced by managing air conditioning, ventilation, refrigeration, computer systems and lighting power use. For example, each 1,000 watts of lighting on during 60 weekly operating hours but now turned off manually or via motion detectors or timers, would save *$300 annually. Each 1,000 watts of T-8 fluorescent lighting converted to LED's could save *$150 annually. Controlling Power Factor can also save costs.
**A 5% reduction in your total electricity use could save *$17,000 annually.**

Water Use Intensity




**Your building Water Use Intensity of 33 gallons/sq ft is below the Minneapolis Hotel Buildings median.**
Water use can be further reduced. Minneapolis water costs .92 cents/gallon including sewer charges, plus fees in 2016. Heating water for lav use can costs more than .5 cents/gallon. And Minneapolis water rates are increasing over 3% per year. Increasing efficiency of fixtures, dish washers, shower heads, and irrigation can save. And storm water charges can be significantly reduced via landscaping changes. See the City Water Department website.

* Savings are order of magnitude estimates.

**Your 2016 water use was 5,830,000 gallons. Each 10,000 gallon reduction in domestic water use saves $92.**

Pathways for Improvement

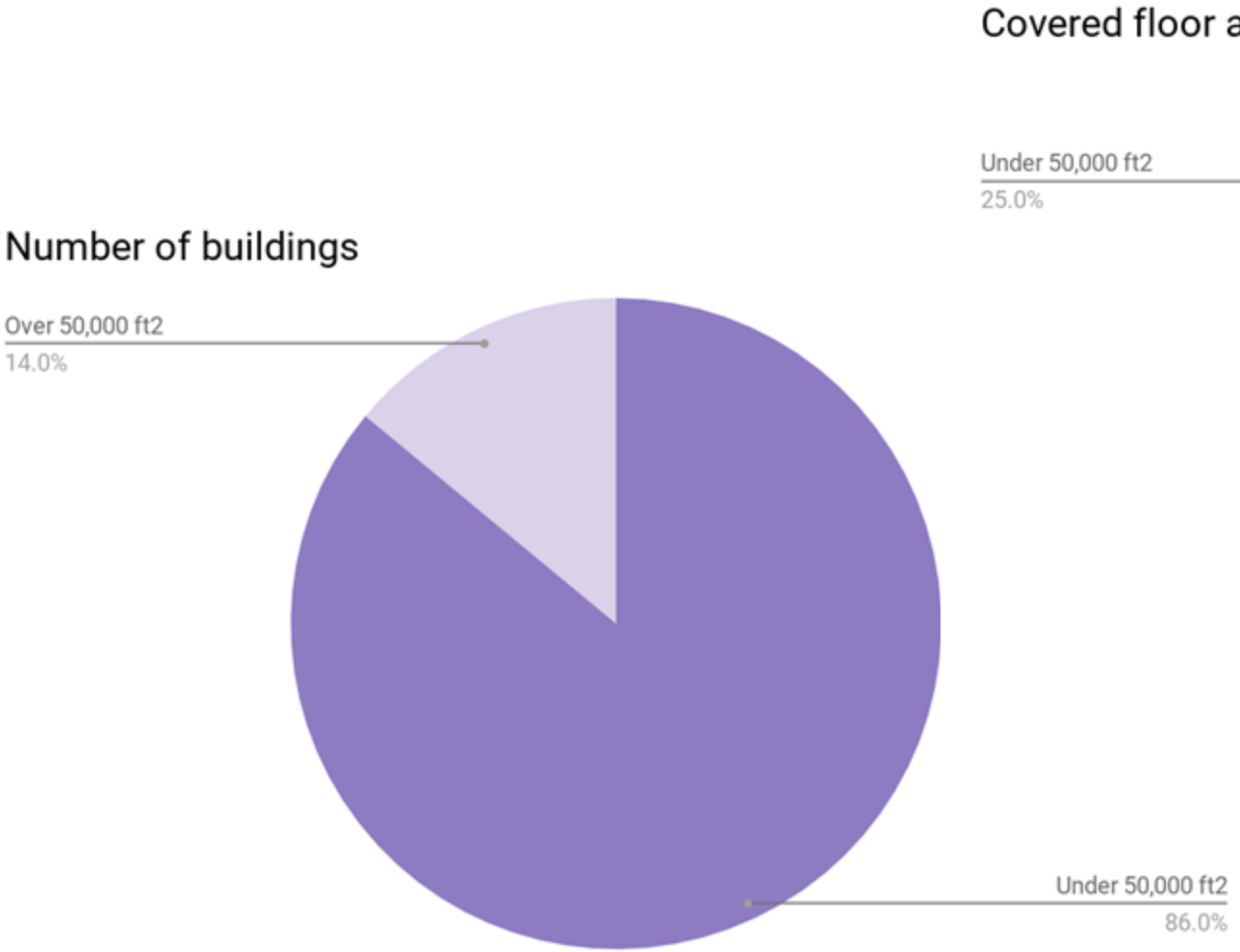
1.Building Energy Challenge
Join buildings across the city to reduce greenhouse gas emissions 15% by 2020.
www.minneapolisenergybenchmarking.org/challenge/

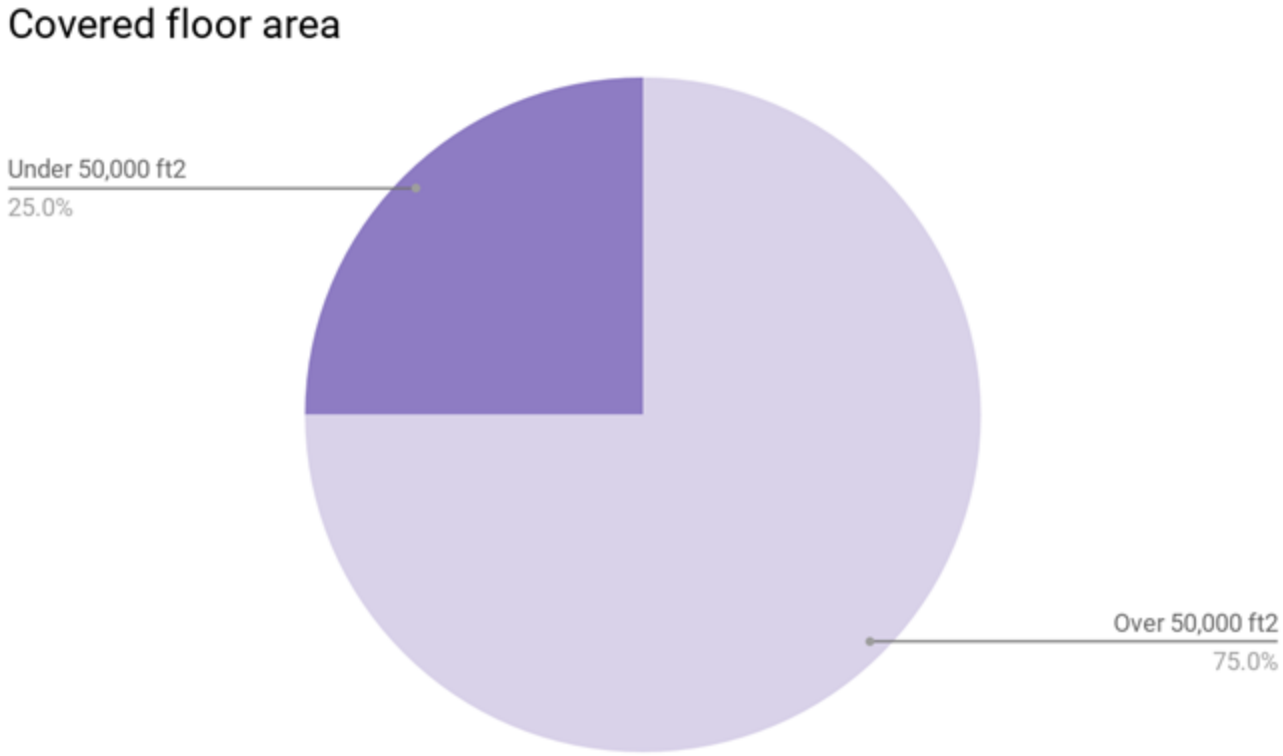
2. City Funding for Energy Efficiency
Apply for a Green Business Cost Share for your next energy efficiency project
www.ci.minneapolis.mn.us/environment/green/index.htm

3.ENERGY STAR Certification Grants
Certify your high-performing building with a City grant covering 60% of review costs!
www.minneapolisenergybenchmarking.org/funding/grants/

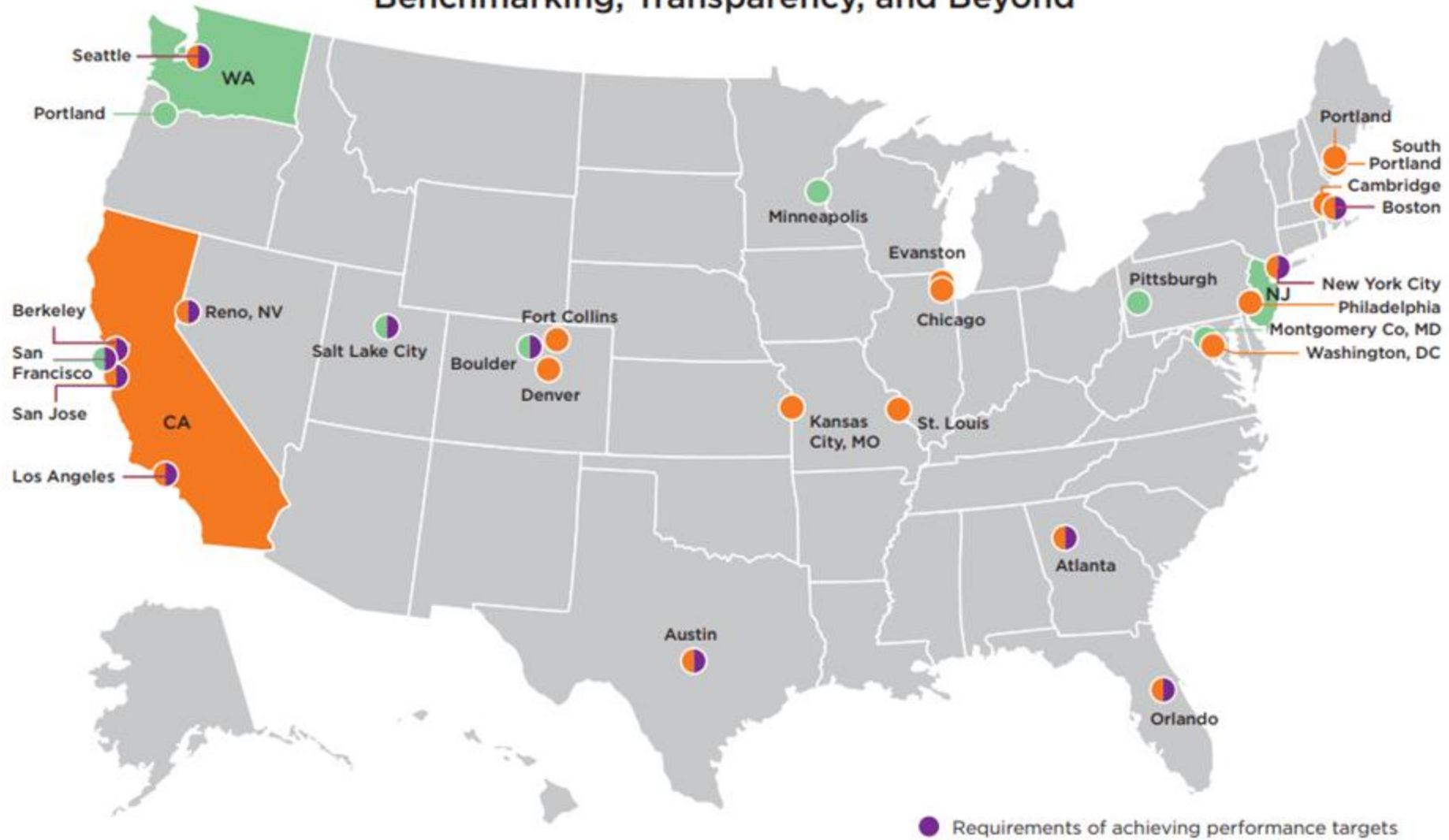
Page 2 of 2

# San Antonio - Commercial Buildings Breakdown



# U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond




Building Rating

IMT INSTITUTE FOR MARKET TRANSFORMATION

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# ENERGY STAR Certified Buildings

# Benchmarking Tools

## ENERGY STAR Portfolio Manager

# So I’m using Portfolio Manager for City Benchmarking, how else is it useful?

ENERGY STAR® Portfolio Manager®

Anna Morton, P.E.
Morton Gestalt
mortongestalt.info

# What is Portfolio Manager?

- Free, Online Building Benchmarking tool
- Run by the EPA
- Launched in 1999
- Use in 2018
  - 270k properties
  - 26 billion square feet

# Who Is Using Portfolio Manager?

- Building owners, managers, tenants, service providers
- Local, county, and state governments, some with benchmarking and public disclosure policies
- Federal agencies under executive orders & statutes
- Green building certification programs
  - LEED, Green Globes
- Consumer information sites
  - TripAdvisor, CoStar, Apartments.com
- Investors, via sustainability reporting and ranking
  - GRESB, Greenprint, CDP
- Multifamily financing industry
  - Fannie Mae, Freddie Mac, HUD
- **Your Local 2030 District**

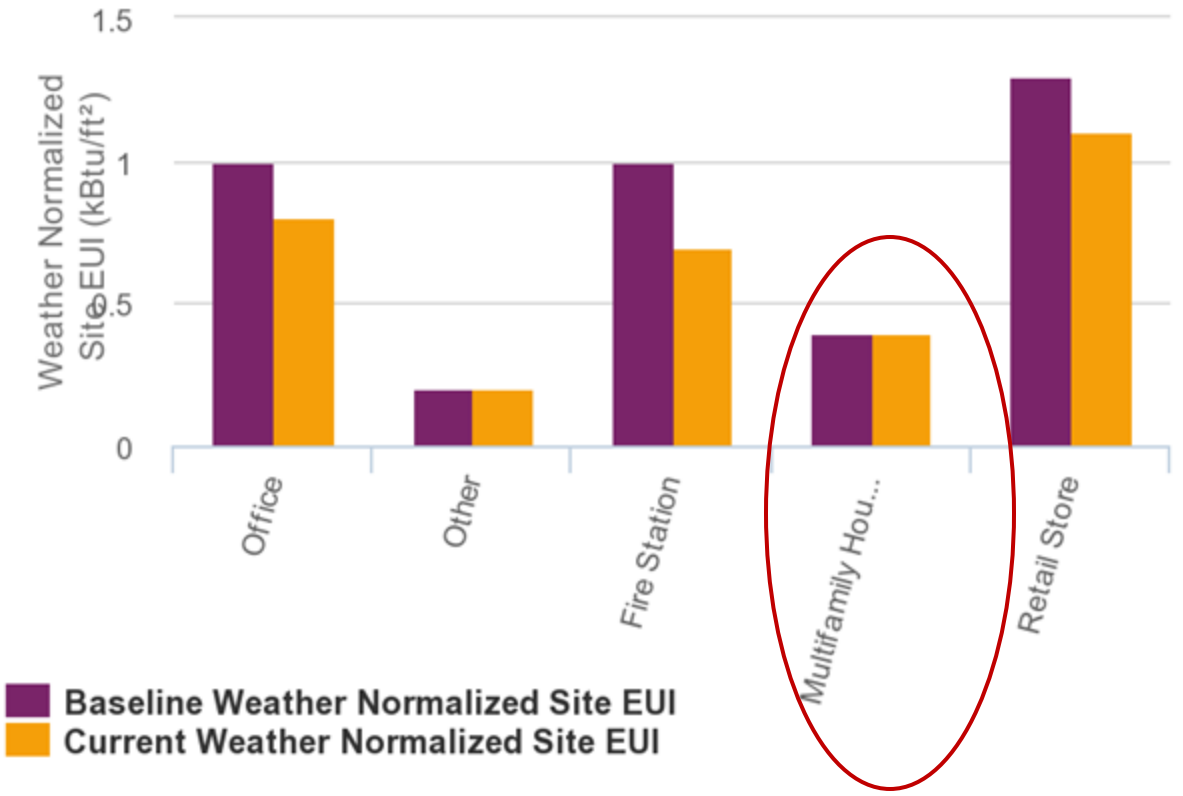
SAN ANTONIO 2030 DISTRICT®

# How is Portfolio Manager used in the Benchmarking Process?

upload utility data to property

share property with the city

# Identify Opportunities



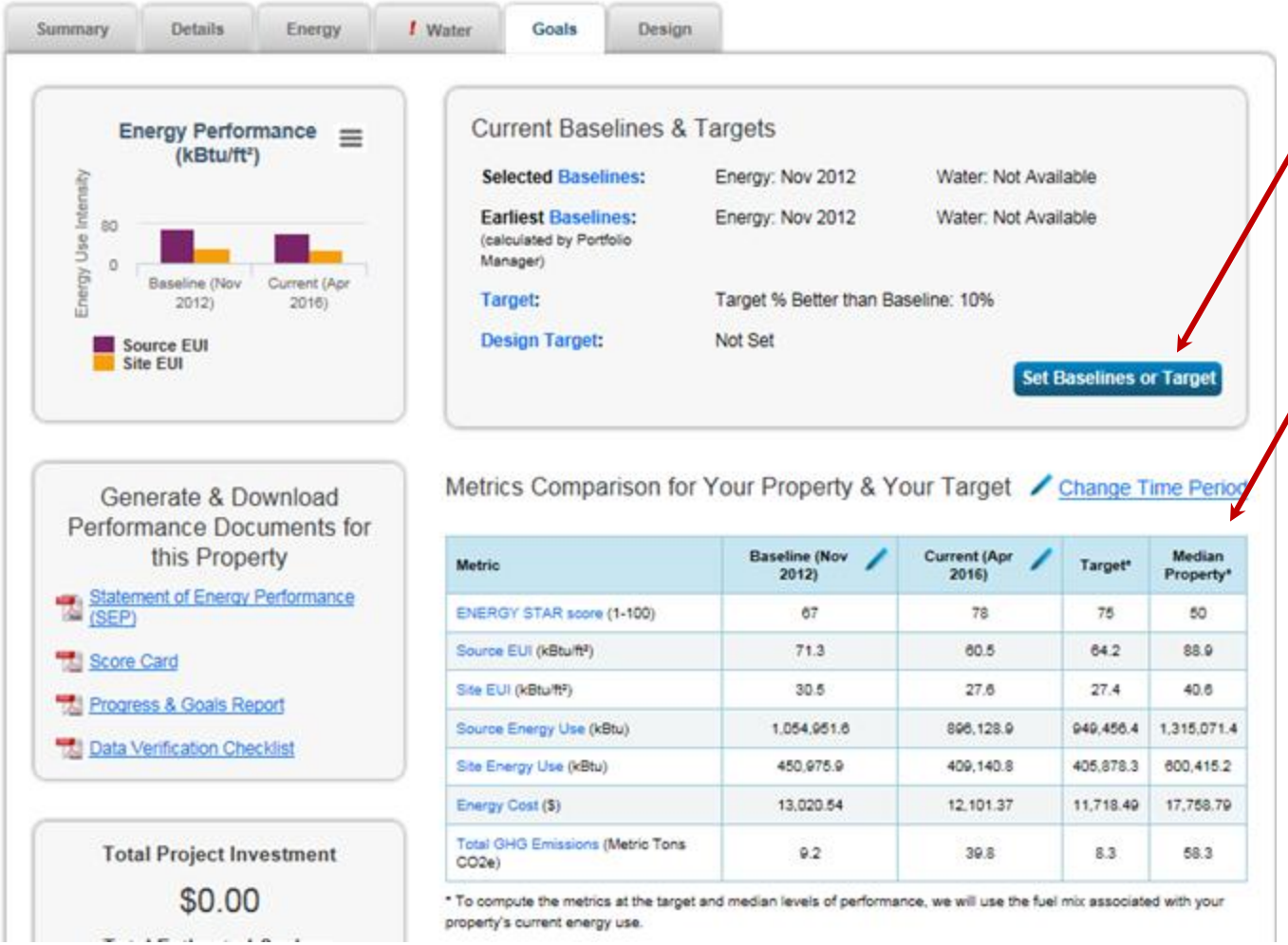

Select Property Types

| | Property Type | Number of Properties |
|---|---|---|
| ☐ | All Properties | 43 |
| ☑ | Office | 21 |
| ☑ | Other | 5 |
| ☑ | Fire Station | 4 |
| ☑ | Multifamily Housing | 4 |
| ☑ | Retail Store | 2 |
| ☐ | Ambulatory Surgical Center | 1 |
| ☐ | Courthouse | 1 |
| ☐ | Non-Refrigerated Warehouse | 1 |

Selected Types 5

Apply Selection

# Set Goals and Track Progress




| Metric | Baseline (Nov 2012) | Current (Apr 2016) | Target* | Median Property* |
|---|---|---|---|---|
| ENERGY STAR score (1-100) | 67 | 78 | 75 | 50 |
| Source EUI (kBtu/ft²) | 71.3 | 60.5 | 64.2 | 88.9 |
| Site EUI (kBtu/ft²) | 30.5 | 27.6 | 27.4 | 40.6 |
| Source Energy Use (kBtu) | 1,054,961.6 | 896,128.9 | 949,456.4 | 1,315,071.4 |
| Site Energy Use (kBtu) | 450,975.9 | 409,140.8 | 405,878.3 | 600,415.2 |
| Energy Cost ($) | 13,020.54 | 12,101.37 | 11,718.49 | 17,758.79 |
| Total GHG Emissions (Metric Tons CO2e) | 9.2 | 39.8 | 8.3 | 58.3 |

* To compute the metrics at the target and median levels of performance, we will use the fuel mix associated with your property's current energy use.

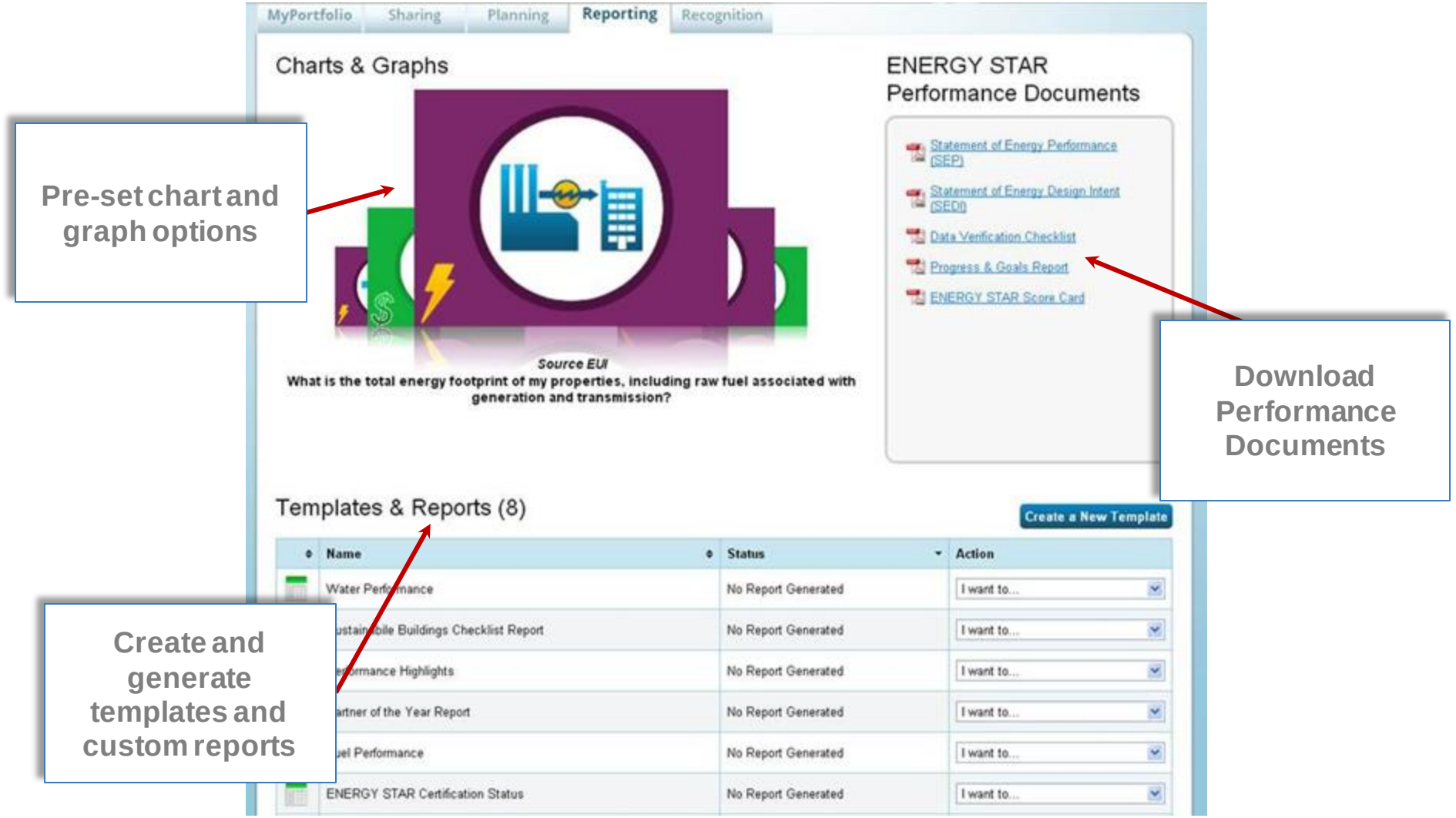
Set performance targets and baselines

Monitor progress and document savings goals achieved

Track targets at the building or portfolio levels

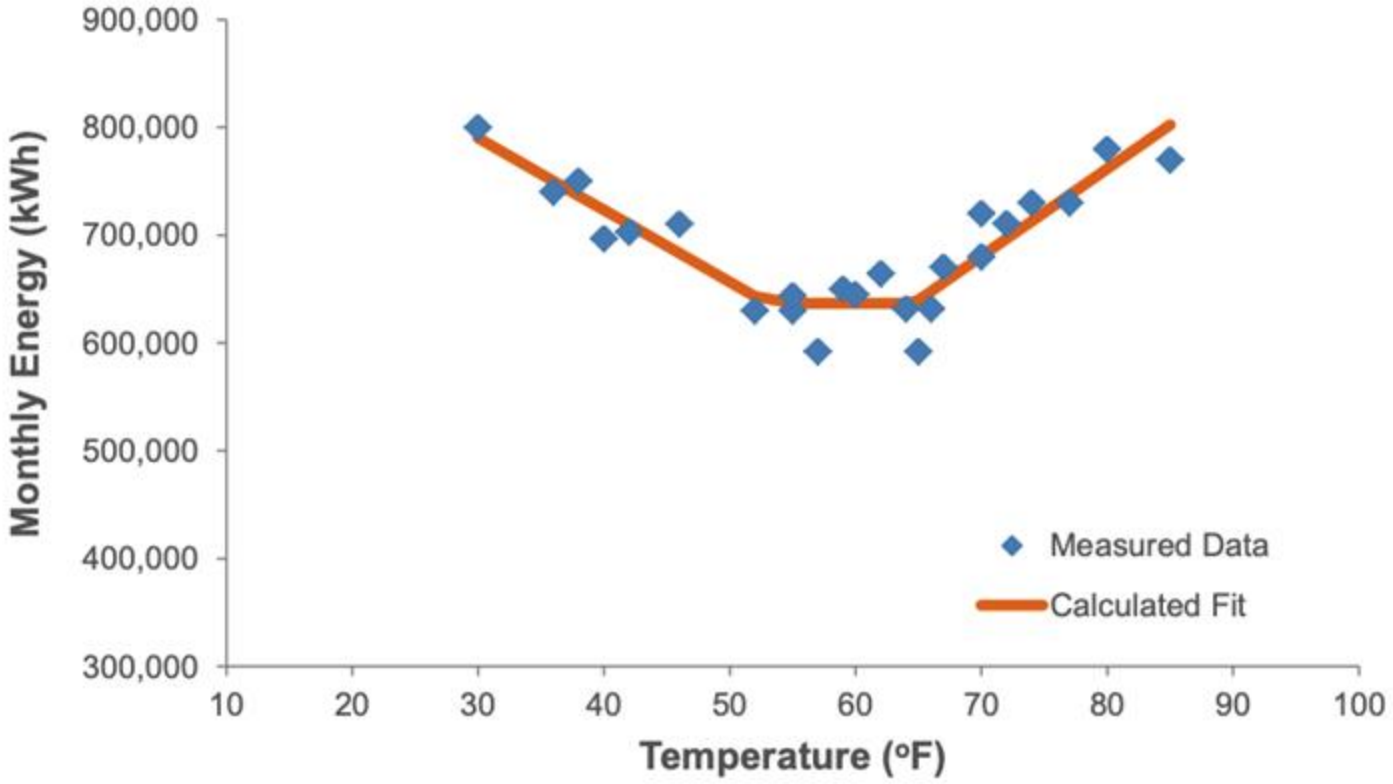
# Useful Features and Resources

# Reporting


MyPortfolio
Sharing
Planning
Reporting
Recognition
Charts & Graphs
Source EUI
What is the total energy footprint of my properties, including raw fuel associated with generation and transmission?
ENERGY STAR Performance Documents
Statement of Energy Performance (SEP)
Statement of Energy Design Intent (SEDI)
Data Verification Checklist
Progress & Goals Report
ENERGY STAR Score Card
Templates & Reports (8)
Create a New Template
Name
Status
Action
Water Performance
No Report Generated
I want to...
Sustainable Buildings Checklist Report
No Report Generated
I want to...
Performance Highlights
No Report Generated
I want to...
Partner of the Year Report
No Report Generated
I want to...
Fuel Performance
No Report Generated
I want to...
ENERGY STAR Certification Status
No Report Generated
I want to...
Pre-set chart and graph options
Download Performance Documents
Create and generate templates and custom reports

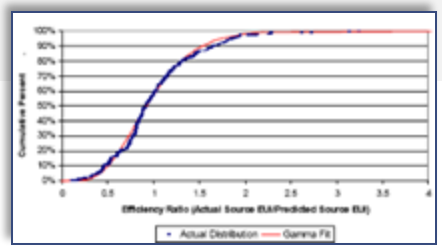
# Weather Normalization

*Figure 5 – Example Plot and Fit for 24 Months of Actual Energy and Weather Data*



# Develop an ENERGY STAR Score

Nationally representative survey

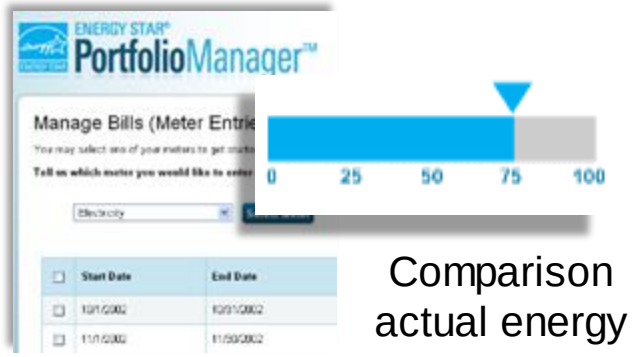


Data analysis

Descriptive Statistics for Variables in Final Regression Model

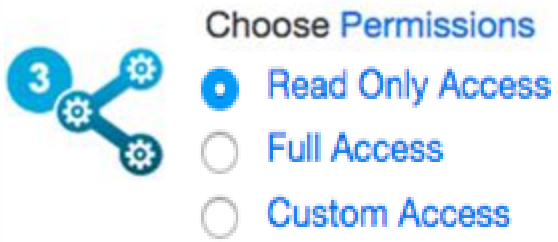
| Variable | Full Name | Mean | Minimum | Maximum |
|---|---|---|---|---|
| SrcEUI | Source Energy per Square Foot | 198.4 | 19.62 | 1133 |
| LNSqFt | Natural Log of Square foot | 9.535 | 8.517 | 13.82 |
| PCDen | Number of Computers per 1000 ft2 | 2.231 | 0.0273 | 11.11 |
| LNWkHrs | Natural Log of Weekly Operating Hours | 3.972 | 3.611 | 5.124 |
| LNWkrDen | Natural Log of Number of Workers per 1000 ft2 | 0.5616 | -3.882 | 2.651 |
| HDDxPH | Heating Degree Days x Percent Heated | 4411 | 0.0000 | 9277 |
| CDDxPC | Cooling Degree Days x Percent Cooled | 1157 | 0.0000 | 5204 |

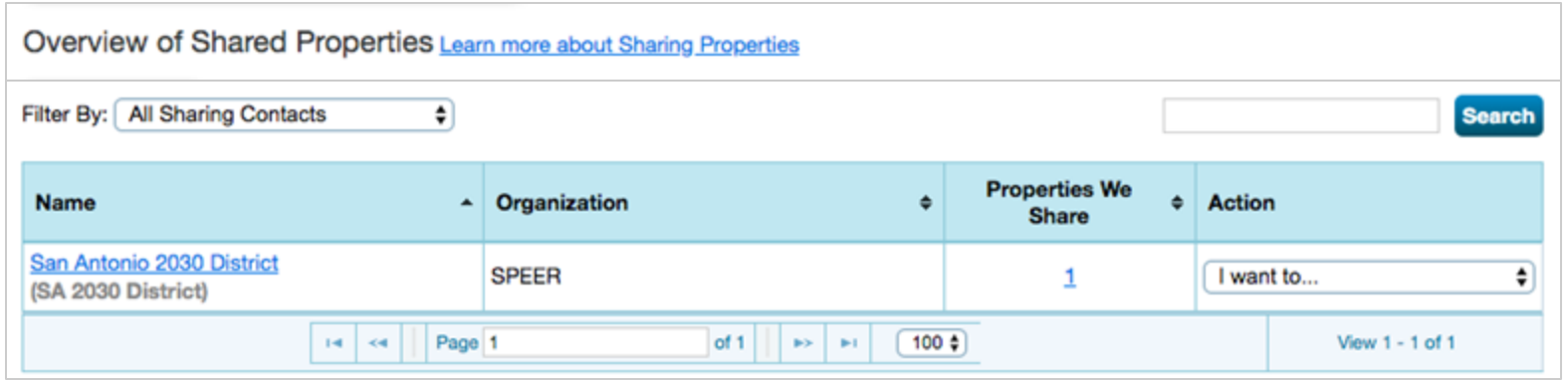
Statistical modeling



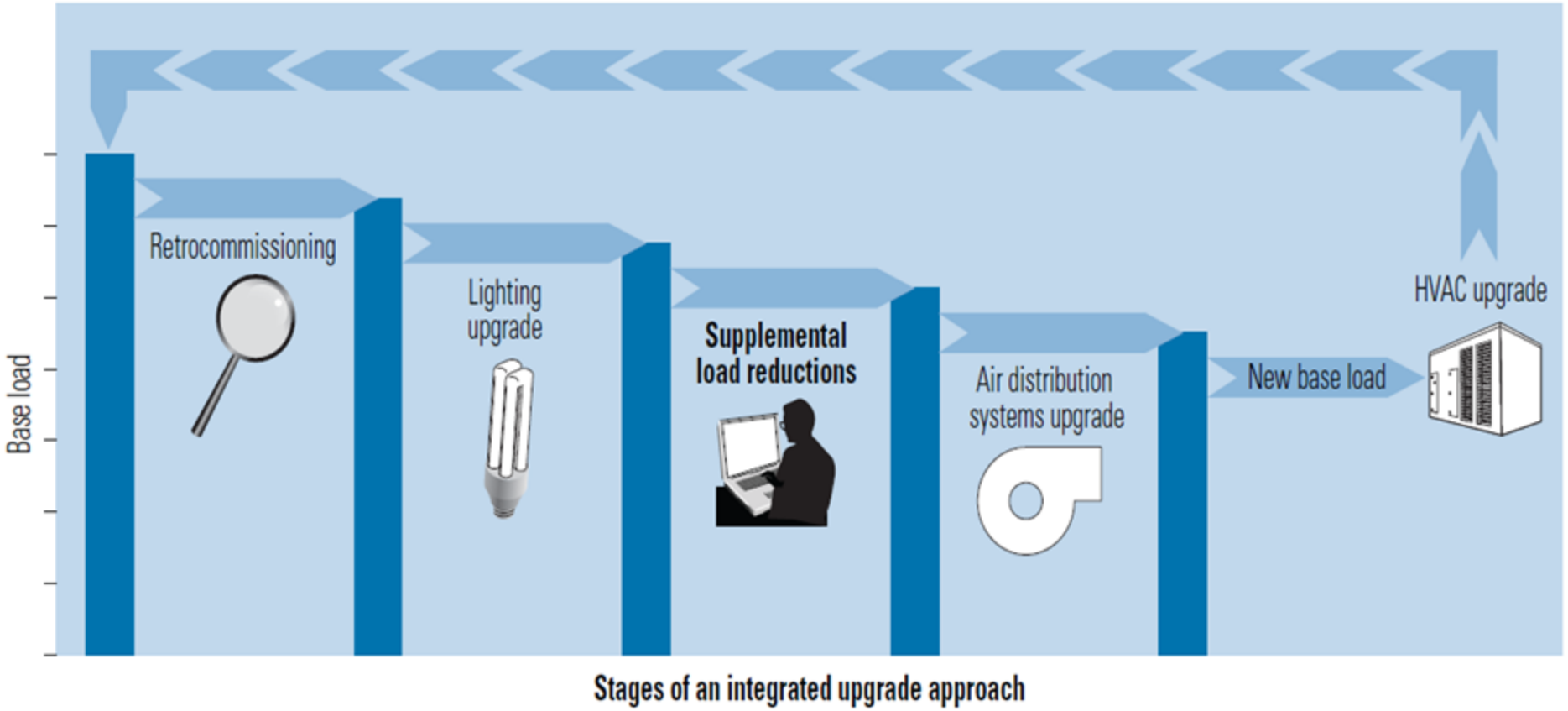

Comparison between actual energy data and the modeled estimate

# Property Sharing



# Building Upgrade Manual




Stages of an integrated upgrade approach

First reduce required levels of heating & cooling to make HVAC replacements and upgrades smaller and cheaper.



http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/comprehensive-approach/energy-star

# Building Upgrade Manual

- **Managing and Planning Upgrade Projects**
  - Chapter 1: Introduction
  - Chapter 2: Benchmarking
  - Chapter 3: Investment Analysis
  - Chapter 4: Financing
- **5-Staged Approach to Upgrade Projects**
  - Chapter 5: Retrocommissioning
  - Chapter 6: Lighting
  - Chapter 7: Supplemental Loads
  - Chapter 8: Air Distribution Systems
  - Chapter 9: Heating and Cooling
- **Unique Facility Types**
  - Chapter 10: K-12 Schools
  - Chapter 11: Supermarkets and Grocery Stores
  - Chapter 12: Hotels and Motels
  - Chapter 13: Retail Stores

http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/comprehensive-approach/energy-star

# Cash Flow Opportunity Calculator

ENERGY STAR®
Cash Flow Opportunity Calculator

HELP SAMPLE VALUES

INVESTMENT OPPORTUNITY

**Potential Annual Savings = Cash Flow Opportunity**

| | Indoor Lighting | Outdoor Lighting | Plug Loads | Air Distribution Systems | Heating and Cooling | Totals |
|---|---|---|---|---|---|---|
| Annual energy costs | $300,000 | $1,700,000 | $300,000 | $200,000 | $1,000,000 | $2,500,000 |
| Potential annual savings | $45,000 | $425,000 | $30,000 | $20,000 | $200,000 | $720,000 |

**What Can $720,000.00 of Annual Savings Buy?**

| | | |
|---|---|---|
| Assuming an interest rate of | 5 | % |
| Assuming a term of | 10 | Year(s) |
| Savings used to pay energy/retrofit investments | 90.0 | % |
| Additional funds such as rebates, etc. (if available) | $100,000 | |

Reset

Taken from operating funds, these savings could finance energy/retrofit projects equal to **$5,310,400** without increasing today's capital and operating budgets. *(Note: Savings calculated on a monthly basis).*

NOTE: If the project cost is greater than the above savings will cover and additional capital contributions are unavailable, see how adjusting the term, percentage of savings used, and/or interest rate affects the total before reducing the project size, which may also affect savings.

| | | |
|---|---|---|
| Contribution that your operating budget can make towards energy improvements | | / |
| Simple Payback | 7 | Year(s) |
| | 5 | Month(s) |

Consider blending short- and long-term projects to maximize use of the savings.

# And growing…

| Category | Description |
|---|---|
| Basic Account Services | Allows you to manage your account as well as create accounts for your customers. |
| Connection/Share Services | Allows you to connect to existing Portfolio Manager customers and their properties and meters. |
| Property Services | Allows you to manage your customers' properties. |
| Building Services | Allows you to manage specific portions of your customers' properties. |
| Property Use Services | Allows you to manage specific operational areas of your properties. |
| Meter Services | Allows you to manage meters (electric, natural gas, water, IT, flow meters, waste, etc.) and their data records. |
| Reporting Services | Allows you to retrieve key performance metrics such as the ENERGY STAR score as well as other metrics that help measure your energy efficiency. |
| Target Finder Services | Allows you to set energy targets and retrieve key performance metrics such as the ENERGY STAR score as well as other metrics based on a submitted property design. |

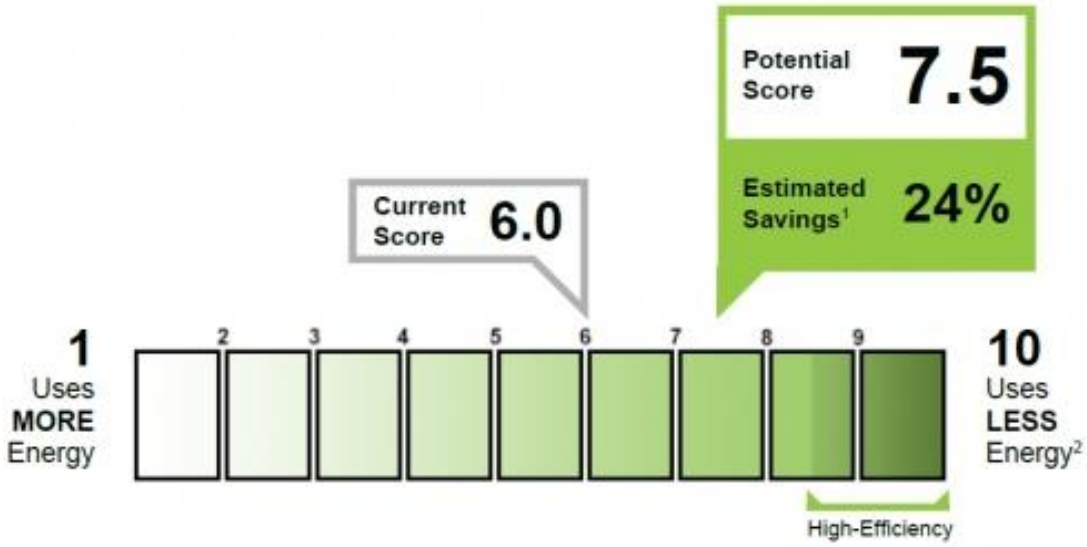
Download all the schemas

**Web Services:**

1. Connect Meters
2. Interface with other Applications

**Asset Score:**

1. Asset based upgrade recommendations
2. Generates Whole building energy model



# How have you used Portfolio Manager?

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Climate Challenge

# Building Owner Capacity Development

# Considerations for ESPM use:

**E.g. *What is your building's Energy Use Intensity (EUI)?***

- Where would you look for that information?
- How much time would it take you to find that information?
- How many employees in your business would be involved in tracking down that information?

# Benchmarking Support

- Workshops, trainings and events:
  - Benchmarking 101
  - Quarterly Networking and Education events – best practices and case studies (also, Green leasing strategies, etc.)
  - Kick-off event
- Help Desk – Office hours for in person or phone line?
  - Volunteers

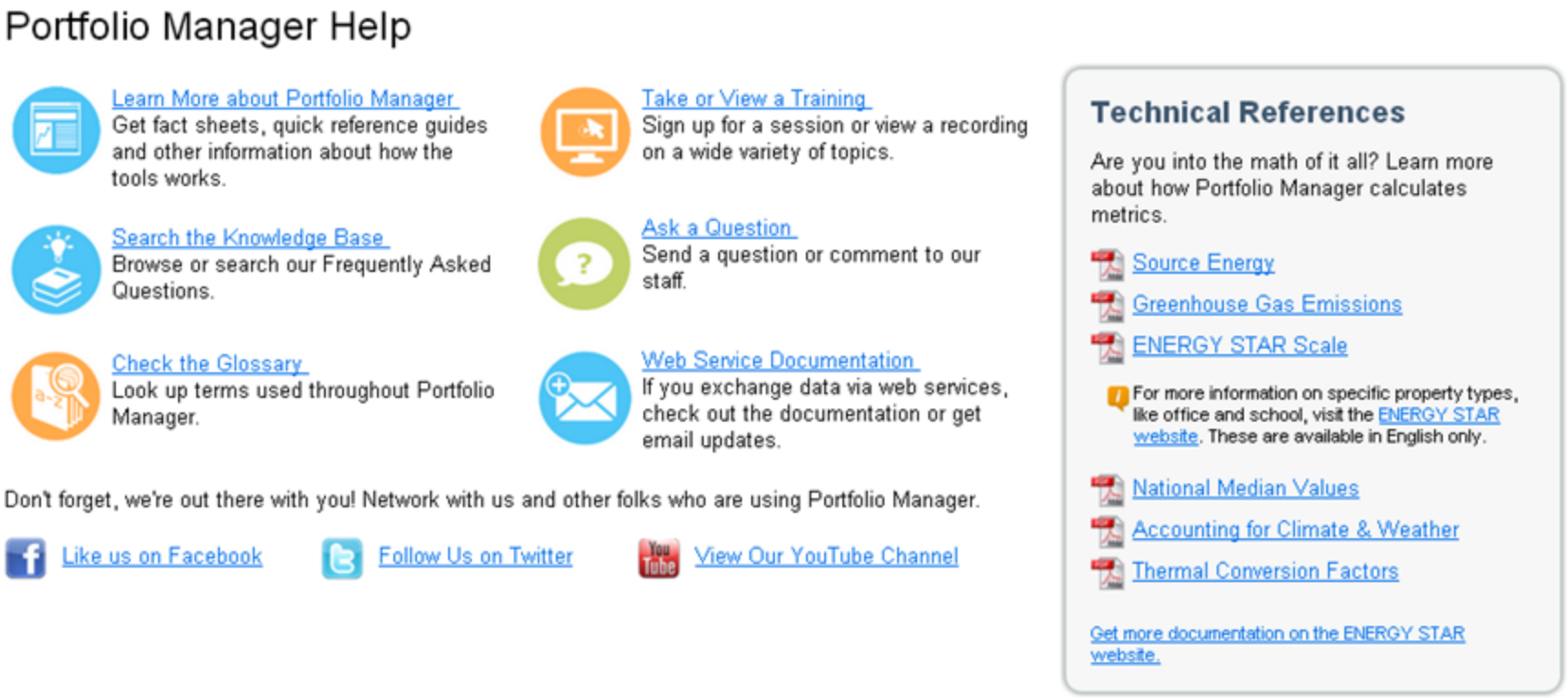
# Outreach

- Draft and share policy outline with BAC
- Kick-off event(s)
- Notices & mailings
- Via partners and BAC members

# Discussion

- How can the City support the reporting process?
- Do any working groups need to be designated for implementation?

# ENERGY STAR Help Desk



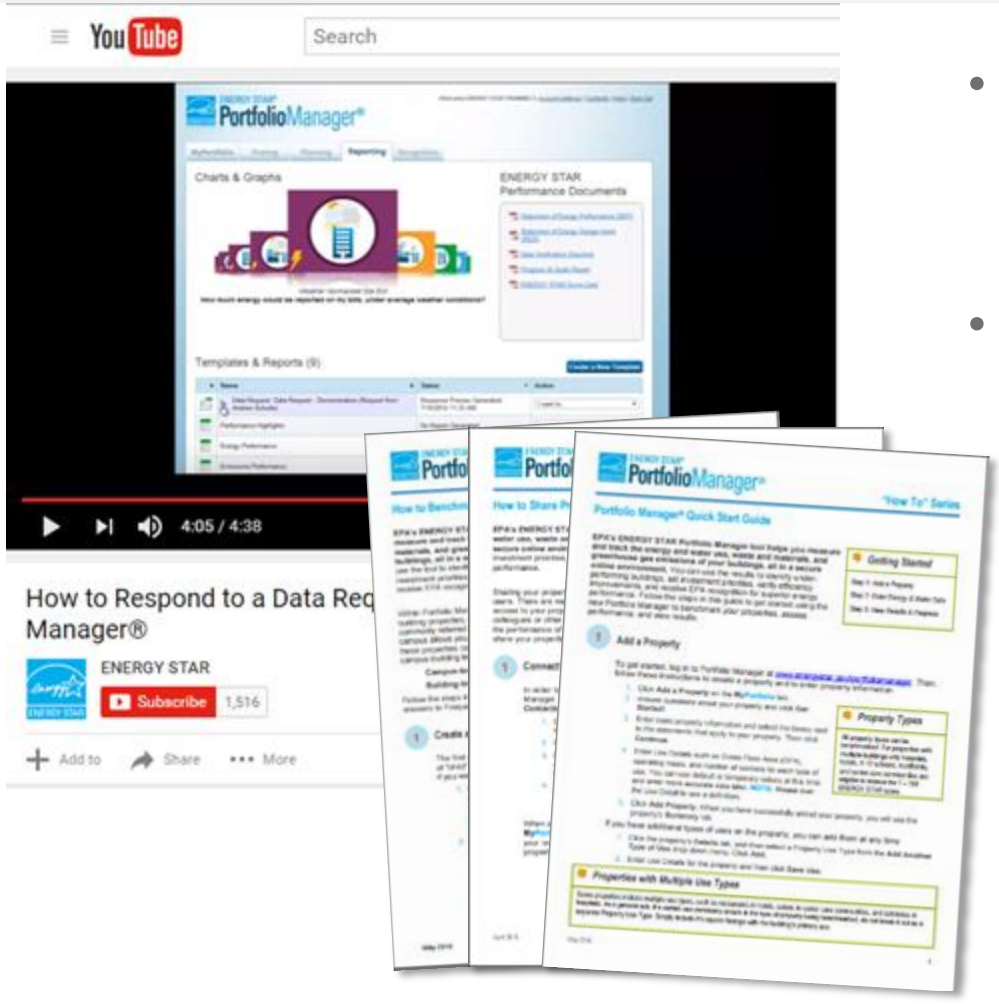

On-demand user support at energystar.gov/buildingshelp

# Find service provider

**ENERGY STAR Service and Product Provider (SPP) partners**

- Businesses and organizations that use ENERGY STAR tools and resources to help customers:
  - Benchmark their buildings
  - Achieve energy performance improvements
  - Earn ENERGY STAR recognition
- Experienced with ENERGY STAR
- Searchable on the ENERGY STAR website
- For more information on ENERGY STAR SPPs, visit energystar.gov/ExpertHelp

# Portfolio Manager Training




- Weekly live webinars available on the Trainings page
- 3-7 minute training videos on YouTube

Step-by-step training guides, FAQs, and technical reference documents

# Proposed Meeting Schedule

- ~~Meeting 1 – Oct 22, 2019, Tue~~
- ~~Meeting 2 – Dec 17, 2019, Tue~~
- ~~Meeting 3 – Jan 21, 2019, Tue~~
- Meeting 4 – Feb 21, 2019, Fri
- Meeting 5 – Mar 24, 2019, Tue
- Meeting 6 – Apr 23, 2019, Thr

# Topics of Discussion

- Building stock ~~and benchmarking tools~~
- ~~Energy data management, privacy, and use~~
- ~~Building owner capacity development and support~~
- Policy structure, compliance, and recognition
- Implementation phasing and support; financing tools

# Contacts


- Doug Melnick, Chief Sustainability Officer, City of San Antonio, Douglas.Melnick@sanantonio.gov
- T. Adil Chowdhury, Climate Advisor, Natural Resources Defense Council, achowdhury@nrdc.org